

# Winter Driving Safety

Michael Borkowski  
Occupational Safety and Health Specialist  
Knowledge Management (Shore) Directorate

November 2021



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED

# Winter Driving Safety



## ***WINTER DRIVING SAFETY***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED

# Winter Driving Safety

## Follow this 10-point plan for safe winter driving

The arrival of winter often comes hand in hand with heavy rain, fog, ice and snow. Bad weather affects visibility and stopping distances. Follow this 10-point plan and be a safe winter driver.

1. If you feel uncomfortable driving in bad weather, consider whether your journey is really necessary or whether you can go by an alternative mode of travel.
2. Allow extra time for your trip and reduce your speed appropriately as needed.
3. Increase the distance between you and the vehicle in front of you to ensure you can stop within the distance you've identified to be clear.
4. Not all vehicles are equipped with daytime running lights. Turn on your headlights to increase your vehicle's visibility so other drivers see you.
5. If visibility is reduced by fog, use low beam headlights and fog lights. Switch on your wipers to keep your windshield clear.



# Winter Driving Safety

## 10-point plan for safe winter driving, continued

6. Remember the obvious - you can see snow, but you can't always see ice.
7. Avoid sudden braking, accelerating too quickly and harsh steering in slippery conditions.
8. Keep your windshield and all windows clear of all snow and periodically check to ensure snow isn't sticking and accumulating on your headlights and tail lights.
9. Carry a shovel, extra warm clothing, a blanket, snacks and water or other beverages - especially if you are traveling through isolated areas.
10. If you are going on a long journey, advise someone of your destination and what time you expect to arrive.



# Winter Driving Safety

## **Before you begin a journey during wintry weather conditions:**

- ☐ Check local and national weather forecasts.
- ☐ Listen to local and national radio for travel information.
- ☐ Consider bringing warm clothes, boots and a flashlight – in some emergency situations, a long walk could be involved.
- ☐ Clear your windows and mirrors of snow and ice before you set out.





# Winter Driving Safety

## Winter tips

Everyone is potentially at risk during winter storms. The actual threat to you depends on your specific situation. Tips provided by the National Highway Traffic Safety Administration (NHTSA):

- ☐ Avoid risky driving behaviors.
- ☐ Don't text and drive.
- ☐ Establish and maintain a greater following distance from other vehicles.
- ☐ Don't crowd or travel beside snow plows.
- ☐ Keep in mind that while a road may appear clear, it still may not be safe to drive the posted speed limit.
- ☐ Understand the dangers of winter storms. Think critically through a weather situation and make intelligent decisions based on the reliability of that weather information.
- ☐ Understand the potentially severe consequences of your decisions while driving in adverse weather conditions. Consider installing weather and traffic apps on your cellphone before starting a trip.



# Winter Driving Safety

## Terminology

- ❖ SLEET – A form of freezing rain that can vary from liquid to frozen precipitation at any time.
- ❖ FLURRIES - Light snow falling for short durations. There may be little to no accumulation or forecasters may only call for a light dusting.
- ❖ SNOW SHOWERS - Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- ❖ SQUALLS - Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- ❖ BLIZZARD – Strong winds and heavy snow combined to produce reduced visibility.

**Above all, remember weather forecasts are predictions. The weather can change and forecasts may turn out to be inaccurate – be prepared!**



# Winter Driving Safety

## Wind chill:

A still-air temperature that would have the same cooling effect on exposed human skin as a given combination of temperature and wind speed.

With a temperature of 5 F and winds blowing at 35 mph, the wind chill index would be minus 21 F, which could cause frostbite within 45 minutes (**increased danger**).

With a temperature of minus 20 F and winds blowing at 35 mph, the wind chill index would be minus 55 F and could cause frostbite in less than five minutes. (**great danger**).

## Wind Chill Temperature Table

Wind Speed (mph)	Air Temperature (°F)																	
↓	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
0	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-59	-67	-74	-81	-88	-95

GREEN

 LITTLE DANGER (frostbite occurs in >2 hours in dry, exposed skin)

YELLOW

 INCREASED DANGER (frostbite could occur in 45 minutes or less in dry exposed skin)

RED

 GREAT DANGER (frostbite could occur in 5 minutes or less in dry, exposed skin)

Read right and down from the calm air line. For example, a temperature of zero F combined with a 20 mph wind has an equivalent cooling effect of minus 22 F.





# Winter Driving Safety



## ***DRESS FOR THE TRIP***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED

# Winter Driving Safety

## Key word: layers

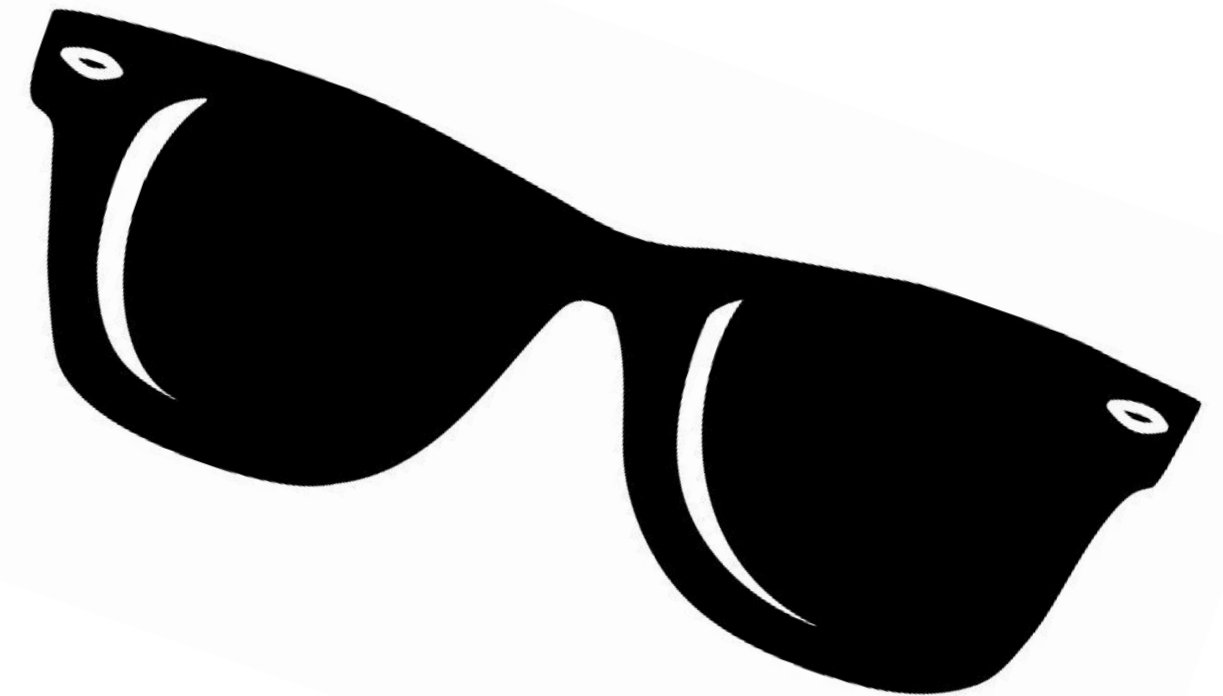
- ☐ Dress for the cold.
- ☐ Wear several layers of thick, loose-fitting clothing.
- ☐ Wear a hat, scarf, turtleneck or sweater.
- ☐ The head and neck lose heat faster than any other part of the body.
- ☐ Don't forget a pair of winter gloves and maybe some boots.



# Winter Driving Safety

## Sunglasses + winter sun

- ☐ You may ask yourself what sunglasses have to do with winter. The effect the sun has when it reflects off snow and ice can be blinding.
- ☐ Good, quality sunglasses help you identify changes in the terrain and road surface. Even if the sky is overcast, quality sunglasses can help with snow or ice-induced glare.
- ☐ Some vehicle visors won't help when the sun is low in the sky, and sunglasses can come in handy.



# Winter Driving Safety



## ***PREPARE YOUR VEHICLE***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED



# Winter Driving Safety

## **Routine precautions help you avoid problems**

- ☐ When was your vehicle's last engine tuneup?
- ☐ Top off your vehicle with fuel and consider adding a fuel additive for winter conditions.
- ☐ Check all lights and make sure they are in good working order.
- ☐ Check your brakes.
- ☐ Check your owner's manual for oil recommendations for winter driving.
- ☐ Dirty oil can give you trouble in the winter, so change the oil and filter. Check all other filters within your vehicle and refer to the owner's manual.



# Winter Driving Safety

## **Routine precautions help you avoid problems, continued**

- ☐ Check your antifreeze – ensure you have the proper ratio recommended for the lowest temperature in the geographical region where you will be traveling.
- ☐ Make sure wiper blades are working properly. Replace wiper blades that have cracks or tears in the rubber.
- ☐ Fill your windshield fluid dispenser with a winter solution that will not freeze.



# Winter Driving Safety

## Battery

### DO NOT FORGET YOUR EYE PROTECTION

- ☐ Make sure battery connections are clean and tight.
- ☐ Check both the positive and negative cables for any wear and tear.
- ☐ If battery terminal posts have corrosion buildup, clean with a solution of baking soda and water. Let it foam and then rinse with water. Apply a thin coat of a battery protectant film to the terminal posts to prevent corrosion and reconnect.
- ☐ Be sure all fluids are at proper levels.



# Winter Driving Safety

## Vehicle exhaust

- ☐ Carbon monoxide, present in exhaust fumes, is almost impossible to detect and can be fatal.
- ☐ When breathed in a confined area, the danger of carbon monoxide poisoning can cause death.
- ☐ Have the exhaust system checked for leaks that could send carbon monoxide into your vehicle.
- ☐ Don't warm your car up in your garage with the garage door closed, and don't run it for an extended period of time even with the garage door open, especially if it's an attached garage.
- ☐ Keep in mind fumes can easily seep into the house and overcome those inside, even with an open garage door.





# Winter Driving Safety

## Heating and cooling

- ☐ Not everyone travels to or through regions known for winter weather. If you are heading or traveling through warmer climates, check your cooling system.
- ☐ Check your radiator and hoses for cracks and leaks. Make sure the radiator cap, water pump and thermostat are working properly.
- ☐ Check your owner's manual for recommended strength of the antifreeze.
- ☐ Check both your front, and if equipped, rear defrosters.



# Winter Driving Safety

## Windshields and windows

- ☐ Clean your windshield and all other windows before any trip and consider applying some type of windshield sealer.
- ☐ DO NOT pour hot or warm water onto any glass surface to clear it of ice or snow.
- ☐ One easy tip is to cover your windshield overnight with newspaper or a piece of cardboard if snow is expected. In the morning, all you have to do is find the edge of the paper or cardboard and peel it back.



# Winter Driving Safety

## Vehicle safety kit

- ☐ Snow shovel, snow brush / ice scraper combo.
- ☐ Tow chain or strap.
- ☐ Warning devices (road flares or triangles).
- ☐ Brightly colored cloth to signal for help.
- ☐ Blankets and insulated gloves.
- ☐ Small plastic tarp.
- ☐ Flashlight with extra batteries.
- ☐ Abrasive material (cat litter, sand, salt or traction mats).
- ☐ Jumper cables.
- ☐ First-aid kit.
- ☐ Bottled water and snacks or energy bars.



# Winter Driving Safety



## ***ON THE ROAD – VEHICLE OPERATION***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED



# Winter Driving Safety

## Test the road when unsure

- ☐ When you first pull out onto a road that is covered with snow or ice and ONLY if there is no traffic, tap the brakes to see what type of traction the surface offers.
- ☐ Release the brakes immediately if the tires slide so you don't lose control.
- ☐ You may have to check the road surface periodically throughout your trip, depending on road conditions.
- ☐ Make sure you are aware of how hard you can brake without putting your car into a skid and how much acceleration it will take to move the vehicle without spinning the tires.



# Winter Driving Safety

## Climate controls

- ☐ Maintain a comfortable environment within your vehicle.
- ☐ Adjust your vehicle's climate controls to provide a constant flow of cool air.
- ☐ Cool air versus heated air blowing on you will help keep you alert.
- ☐ Use the heater when necessary and the defrost to keep the windows clear.
- ☐ Keeping one window slightly open will allow you to hear sirens and other warning sounds more quickly.



# Winter Driving Safety

## Lights

- ❑ Most vehicles on the road today come with daytime running lights; if you're unsure if you have them or how to engage them, check your owner's manual.
- ❑ It's always a good idea to turn your headlights on whenever you're driving in weather with limited visibility or rain; turning on your lights allows you to **see** and to be **seen** by others.
- ❑ Remember this rule of thumb: wipers on - lights on.
- ❑ When traveling in snowy weather, remember to clear taillights, signal lights and headlights of snow regularly.



# Winter Driving Safety

## Slow down

- ☐ Plan your trip accordingly.
- ☐ Plan for rest stops, fuel breaks meal breaks.
- ☐ Remember to slow down when the roads get slippery and and anticipate what could be coming around the next curve.
- ☐ You have no control over who is behind the wheel of the vehicle approaching, so pay attention.
- ☐ Always leave yourself a margin of error in the event another driver suddenly loses control of their vehicle and heads your way.





# Winter Driving Safety



***TIRES – TRACTION – SPEED***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED

# Winter Driving Safety

## Tires

- ☐ Make sure the tread depth on your tires is sufficient; look at the tire and ensure the tread wear indicators aren't showing.
- ☐ Do you have enough tread on your tires for dealing with snow? Or are you driving somewhere where you might need snow tires or chains to navigate the roads?
- ☐ Check the tire pressure as it tends to drop when the temperature drops.
- ☐ Look for the manufacturer's recommended pressure on the door label.
- ☐ Check the spare, which is often overlooked.
- ☐ Remember the rule of thumb for a temporary spare, "no more than 50 mph and no more than 50 miles."





# Winter Driving Safety

## Traction

- ❑ Traction is where the tires meet the road surface. Any reduced traction due to snow or ice can be treacherous.
- ❑ If you find yourself in a skid, don't panic; engage your brakes and remember to steer the vehicle.
- ❑ If you get stuck, first clear any accumulated snow from either the front or back of your vehicle depending on your direction of desired travel.
- ❑ Then, gently use the accelerator to rock the vehicle back and forth by first putting it into drive and then reverse.
- ❑ Once the vehicle regains traction, straighten the wheels and drive out of your predicament.



# Winter Driving Safety

## Speed

- ☐ Just because the posted limit is 55 mph does not mean you should be doing 55 on icy or snow-covered roads. Adjust your speed when conditions deteriorate.
- ☐ The anti-lock brake system (ABS) can't perform miracles; but it does keep the brakes from locking. Keep in mind the major advantage to ABS is it allows you to steer the vehicle while braking because the wheels do not lock up.
- ☐ Braking efficiency is always limited by the grip available and the type of tires on your car.
- ☐ Slow down and always use good judgment.





# Winter Driving Safety



***DRIVETRAINS (4WD, FWD, AWD, RWD, TRUCKS)***



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED

# Winter Driving Safety

## Don't overestimate

There are still quite a few rear-wheel drive (RWD) vehicles on the road, not to mention trucks where the drive wheels at the rear handle differently on snow and ice.

While the capability of all-wheel drive (AWD), front-wheel drive (FWD), four-wheel drive (4WD) and trucks may have some advantages when driving in certain conditions, many drivers mistakenly believe these features will help them through icy and snow-covered roads.

Every type of vehicle depends on four small contact patches where the tire meets the road for traction. This small contact area is the limiting factor of any vehicle on a slippery surface. Four-wheel drive does not improve braking or cornering effectiveness.

While these vehicle types may help to keep you moving in snow, they do nothing to help you stop.



# Winter Driving Safety

## Rear-wheel drive

- ☐ Rear-wheel drive vehicles tend to oversteer in bad weather; when you enter a curve and turn sharp, the back of the vehicle wants to come around or skid on you.
- ☐ Due to less weight in the rear, RWD vehicles can easily lose traction in a curve, causing the vehicle to skid out.
- ☐ Rear-wheel drive trucks can be especially vulnerable to this type of skid.
- ☐ In adverse road conditions like snow and ice, place all the items in the trunk to provide the extra weight needed to keep the rear end in line.



# Winter Driving Safety

## Front-wheel drive

- ❑ Two-wheel drive vehicles, either rear or front, can pose different traction and handling issues.
- ❑ Front-wheel drive vehicles tend to do a little better in snow than RWD vehicles, not only in traction, but also in maintaining a straight path due to the engine and transmission weight being over the drive wheels.
- ❑ It's difficult to oversteer a FWD vehicle, which reduces the chance of the rear of the vehicle spinning out.
- ❑ Keep in mind with FWD vehicles we are tasking the front of the vehicle to handle several things at the same time: steering, weight suspension and traction. Traction is most important, so slow down when needed.





# Winter Driving Safety

## All-wheel drive

- ☐ Vehicles equipped with AWD may have two different types of drivetrains, either full-time AWD or part-time AWD. Check your owner's manual.
- ☐ Full-time AWD delivers power to all four wheels at the same time or provides the necessary torque to the drive wheels where needed on slippery surfaces.
- ☐ Part-time AWD provides torque or drive to one axel at a time, either the front wheels or the rear wheels.
- ☐ On snowy or slippery roads, depending on the vehicle's make and model, the system may identify road conditions that will cause the vehicle to automatically engage in full-time AWD.



# Winter Driving Safety

## Four-wheel drive

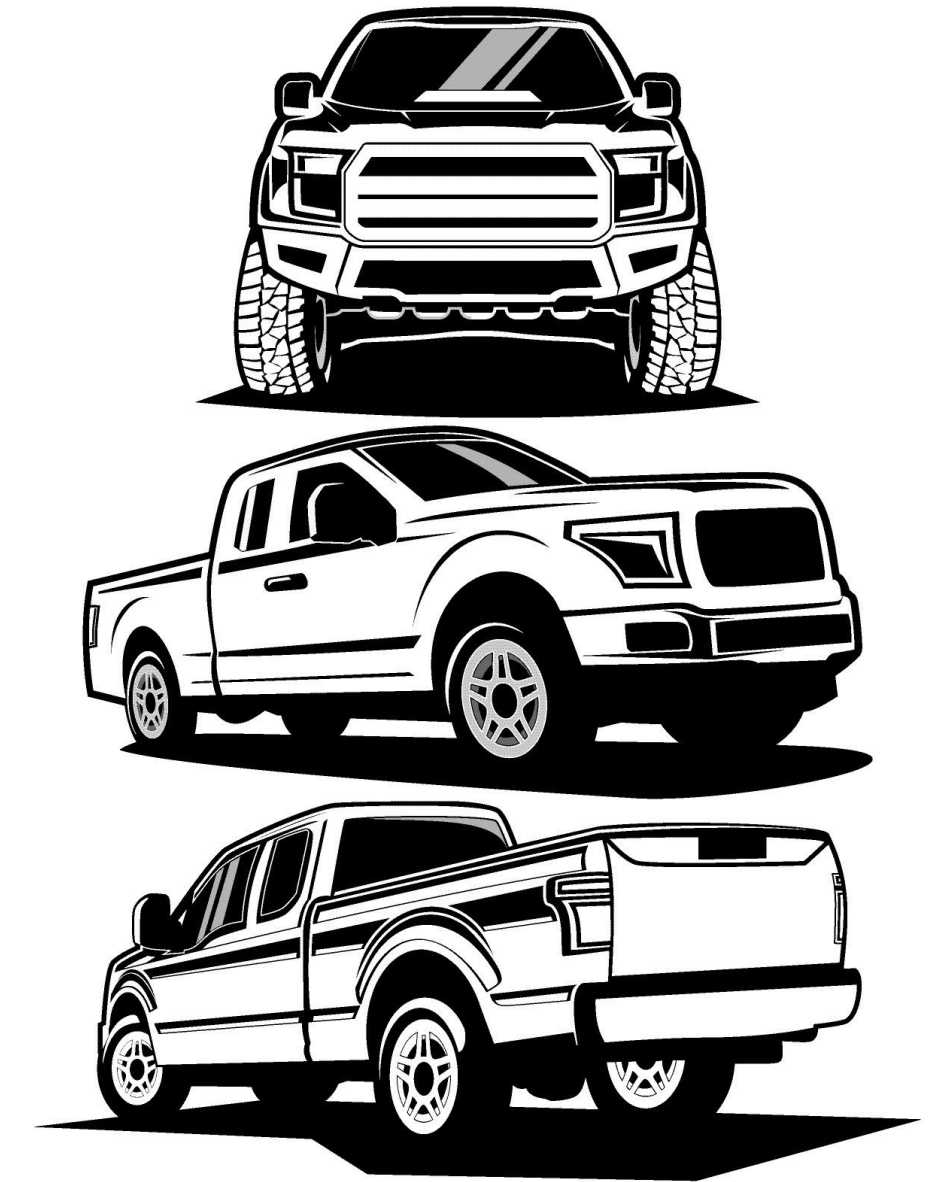
- ❑ This type of drivetrain is now available on a wide range of vehicles. Many SUVs come equipped with 4WD. Four-wheel drive provides drive to all four wheels at the same time, similar to an AWD drivetrain.
- ❑ Four-wheel drive also has a low and high range, depending on the type of traction needed. Low range will provide traction if you leave the road and need to get out of a ditch or embankment. High range will provide the extra traction needed on snow-covered roads.
- ❑ While 4WD may provide different modes of torque depending on the terrain and available traction, 4WD will not prevent your vehicle from losing control on slippery surfaces if too much acceleration is applied.



# Winter Driving Safety

## Trucks

- ❑ Trucks can be a real challenge during snow or icy conditions due to the rear or bed of the truck not having major weight distribution over the rear drive wheels.
- ❑ Trucks may offer a little more ground clearance and may provide access to unplowed roads; the downside is the longer the bed of the truck, the lighter the rear end is and thus, more likely to spin out or lose traction.
- ❑ Two ways to compensate for less weight in the bed of the truck are to place some sand bags in the bed of the truck over the rear drive wheels or to add any snow you shovel right into the truck's bed.
- ❑ DO NOT use something that may become a missile in a crash, such as firewood or cinder blocks.



# Winter Driving Safety

## Risk management reminders

- ☐ Prepare the driver.
- ☐ If you must drive in bad weather, plan ahead and make sure you have enough fuel.
- ☐ See and be seen; clear all snow from the hood, roof, windows and lights.
- ☐ Clear all windows of fog and moisture.
- ☐ If visibility becomes poor, find a place to safely pull off the road as soon as possible.





# Winter Driving Safety

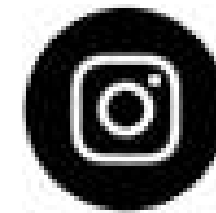
## Review

- ☐ Probably the most important thing to remember when driving in snowy or icy conditions is to drive with caution.
- ☐ Know how your vehicle handles in such weather conditions. This may require some practice on a wide-open parking lot before hitting the road.
- ☐ Remember: The type of vehicle you drive is not as important as how you drive.
- ☐ For more information on winter driving and current conditions, check with your state's department of transportation or tune into your local TV or radio station for weather advisories and road conditions before you head out.



# Winter Driving Safety

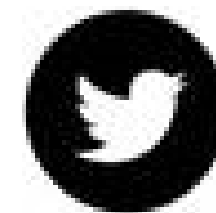
**For more information on how to stay safe this winter, check our website at [www.navalafetycenter.navy.mil](http://www.navalafetycenter.navy.mil) and follow us on social media:**



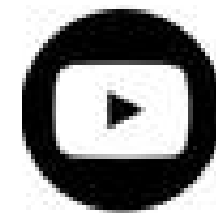
Instagram: [navalsafetycenter](https://www.instagram.com/navalsafetycenter)



Facebook: [NavalSafetyCenter](https://www.facebook.com/NavalSafetyCenter)



Twitter: [@NavalSafetyCtr](https://twitter.com/NavalSafetyCtr)



YouTube: [navalsafetycenterofficial](https://www.youtube.com/navalsafetycenterofficial)



NAVAL SAFETY CENTER  
PRESERVING COMBAT READINESS  
SAVING LIVES  
UNCLASSIFIED